

2016 CALBO Education Week

2016 California Mechanical, Plumbing and Energy Codes: Significant Changes

Instructor: Anthony De Santis
Senior Heating and Refrigeration Inspector
Mechanical Training Officer
Los Angeles Department of Building and Safety

Course Developer: Fady Mattar
PE, CBO
President, JAS Pacific

2016 ENERGY CODE SIGNIFICANT CHANGES

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GENERAL

- Effective 01/01/2017
- Table 100.0-A has been changed
- Design review (Forms CXR 1-5) required on all projects, can be done by an architect

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TABLE 100.0-A APPLICATION OF STANDARDS

Occupancies	Application	Mandatory	Prescriptive	Performance	Additions/Alterations
General Provisions for All Buildings					
Nonresidential, High-Rise Residential, and Hotels/Motels	General	120.0	140.0, 140.2		
	Envelope (conditioned)	110.6, 110.7, 110.8, 120.7	140.3		
	Envelope (unconditioned process spaces)	N.A.	140.3(c)		
	HVAC (conditioned)	110.2, 110.5, 120.1, 120.2, 120.3, 120.4, 120.5, 120.8	140.4	140.0, 140.1	
	Water Heating	110.3, 120.3, 120.8, 120.9	140.5		141.0
	Indoor Lighting (conditioned, process spaces)	110.9, 120.8, 130.0, 130.1, 130.4	140.3(c), 140.6		
	Indoor Lighting (unconditioned and parking garages)	110.9, 120.8, 130.0, 130.1, 130.4	140.3(c), 140.6		
	Outdoor Lighting	110.9, 130.0, 130.2, 130.4	140.7		
	Electrical Power Distribution	110.11, 130.5	N.A.	N.A.	
	Pool and Spa Systems	110.4, 110.5, 150.0(p)	N.A.		141.0
	Solar Ready Buildings	110.10	N.A.		141.0(a)
	Covered Processes ¹	Envelope, Ventilation, Process Loads	110.2, 120.6	140.9	140.1
Signs	Indoor and Outdoor	130.0, 130.3	140.8	N.A.	141.0, 141.0(b)(2)(H)
Low-Rise Residential	General	150.0			
	Envelope (conditioned)	110.6, 110.7, 110.8, 150.0(a), 150.0(b), 150.0(c), 150.0(d), 150.0(e), 150.0(f)			
	HVAC (conditioned)	110.2, 110.5, 150.0(h), 150.0(i), 150.0(j), 150.0(k), 150.0(l)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
	Water Heating	110.3, 150.0(g), (i)			
	Indoor Lighting (conditioned, unconditioned and parking garages)	110.9, 130.0, 150.0(k)			
	Outdoor Lighting	110.9, 130.0, 150.0(k)			
	Pool and Spa Systems	110.4, 150.0(p)	N.A.	N.A.	150.2(a), 150.2(b)
	Solar Ready Buildings	110.10	N.A.	N.A.	N.A.

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¹ Nonresidential, high-rise and hotel/motel buildings that contain covered processes may conform to the applicable requirements of both occupancy types listed in this table.

DEFINITIONS

- Several electrical definitions (electrical covered under a separate class)
- Optimum Start Control:
 - controls that are designed to automatically adjust the start time of a space conditioning system each day with the intent of bringing the space to desired occupied temperature levels at the beginning of scheduled occupancy.
- Optimum Stop Control:
 - controls that are designed to set up or set back thermostat set points before scheduled unoccupied periods based upon the thermal lag and acceptable drift in space temperature that is within comfort limits.
- Table 110.2-A-K Update efficiency requirements (see Tables in Energy Code and in the Appliance Efficiency Standards)

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Table C-2
Standards for Single Phase Air-Cooled Air Conditioners with Cooling Capacity Less than 65,000 Btu per Hour and Single Phase Air-Source Heat Pumps with Cooling Capacity Less than 65,000 Btu per Hour, Not Subject to EPart

Appliance	Minimum Efficiency					
	Effective January 23, 2006		Effective January 1, 2015			
	Minimum SEER	Minimum HSPF	Minimum SEER	Minimum HSPF	Minimum EER	Average Off-Mode Power Consumption P _{off} (watts)
Split system air conditioners with rated cooling capacity < 45,000 Btu/hour*	13.0	—	14.0	—	12.2	30
Split system air conditioners with rated cooling capacity ≥ 45,000 Btu/hour*			14.0	—	11.7	30
Split system heat pumps	13.0	7.7	14.0	8.2	—	33
Single package air conditioners*	13.0	—	14.0	—	11.0	30
Single package heat pumps	13.0	7.7	14.0	8.0	—	33
Space constrained air conditioners – split system	12.0	—	12.0	—	—	30
Space constrained heat pumps – split system	12.0	7.4	12.0	7.4	—	33
Space constrained air conditioners – single package	12.0	—	12.0	—	—	30
Space constrained heat pumps – single package	12.0	7.4	12.0	7.4	—	33
Small duct, high velocity air conditioner systems	13.0	—	13.0	—	—	30
Small duct, high velocity heat pump systems	13.0	7.7	13.0	7.7	—	30

* See 10 C.F.R. section 430.32(c) for less stringent federal standards applicable to these units that are manufactured on or after January 1, 2015 and installed in states other than Arizona, California, Nevada, or New Mexico

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TABLE 110.2-A ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS – MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Efficiency ^{a, b}		Test Procedure ^c
		Before 1/1/2016	After 1/1/2016	
Air conditioners, air cooled both split system and single package	≥ 65,000 Btu/h and < 135,000 Btu/h	11.2 EER 11.4 IEER	11.2 EER 12.9 IEER	ANSI/AHRI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	11.0 EER 11.2 IEER	11.0 EER 12.4 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	10.0 EER 10.1 IEER	10.0 EER 11.6 IEER	ANSI/AHRI 340/360
	≥ 760,000 Btu/h	9.7 EER 9.8 IEER	9.7 EER 11.2 IEER	

TABLE 110.2-B UNITARY AND APPLIED HEAT PUMPS, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Efficiency ^{a, b}		Test Procedure ^c
		Before 1/1/2016	After 1/1/2016	
Air Cooled (Cooling Mode), both split system and single package	≥ 65,000 Btu/h and < 135,000 Btu/h	11.0 EER 11.2 IEER	11.0 EER 12.2 IEER	ANSI/AHRI 340/360
	≥ 135,000 Btu/h and < 240,000 Btu/h	10.6 EER 10.7 IEER	10.6 EER 11.6 IEER	
	≥ 240,000 Btu/h	9.5 EER	9.5 EER	
		9.6 IEER	10.6 IEER	

111 ALSO, CHECK STANDARDS & CHAPTER 4 OF THE NON-RES MANUAL

GENERAL

- 110.3(c)7 Isolation valves required on both hot and cold water lines & hose bibs on each valve for flushing the water heater on instantaneous water heaters > 6,800 Btu/h (2 kW)
- Delete Section 110.8 requiring R-13 in demising wall (mandatory for all) and move to Section 120.7 (non-res mandatory requirement)
- 110.10(a) Delete date of tentative map threshold for Solar Ready requirements (1/1/2014)
- "Habitable stories" is specified in language for threshold requiring solar for ≤ 10 stories res & ≤ 3 stories non-res

SINGLE-FAMILY & LOW-RISE RESIDENTIAL



2016 Residential Energy Savings

- **Overall, 28% more efficient than 2013 Standards**
 - Electric savings = 345 GWHs
 - Demand Reduction = 115 MW
 - Gas Savings = 31 Mtherms
- **Monthly life cycle cost of \$11 with savings of \$31 for “typical” home (statewide)**



LOW-RISE RESIDENTIAL

CALIFORNIA'S 2016 — RESIDENTIAL BUILDING ENERGY EFFICIENCY STANDARDS

California Energy Code 2016

The energy efficiency standards for low-rise residential buildings have been updated to reflect the latest research and technology. The new standards are more stringent, providing savings for owners and occupants. The standards are designed to reduce energy consumption, reduce greenhouse gas emissions, and improve indoor air quality. The standards are designed to be achievable and cost-effective.

\$7,400 SAVINGS OVER A 30-YR. MORTGAGE | **INITIAL COST \$2,700**

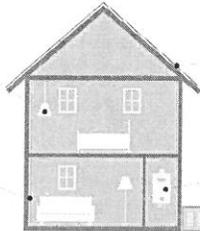
28% more stringent

STRONGER ENERGY RATIONING

Meeting the new standards will result in a high-quality, energy-efficient building. The new standards are designed to be achievable and cost-effective.

HIGH PERFORMANCE VALUES

The new standards are designed to be achievable and cost-effective. They are designed to reduce energy consumption, reduce greenhouse gas emissions, and improve indoor air quality.



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INTERIOR LIGHTING ENERGY SYSTEM EFFICIENCY

The new standards are designed to be achievable and cost-effective. They are designed to reduce energy consumption, reduce greenhouse gas emissions, and improve indoor air quality.

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RES MANDATORY

- 150.0(a):
 - Ceilings/roofs, walls & floors: provide overall U-values in addition to R-values
 - Ceiling/roof mandatory insulation: change to R-22 instead of R-30
- 150.0 (c)3 Insulate mass walls above grade: $U=0.102$ (Frame inside with R-13)
- 150.0(f) Specs for slab edge insulation (moved from 150.0(l))
- 150.0(h) Require "liquid line filter dryers" for A/C or Heat Pumps if required by mfg.
- 150.0(j) Remove requirement to insulate hot water heater with R-12 for those with minimum efficiencies
- New efficiency requirements

Table 4-1: Minimum Efficiency for Gas and Oil-Fired Central Furnaces

Appliance	Rated Input (Btu/hr)	Minimum Efficiency (%)	
		AFUE	Thermal Efficiency
Weatherized gas central furnaces with single phase electrical supply	< 225,000	81	—
Non-weatherized gas central furnaces with single phase electrical supply	< 225,000	80	—
Weatherized oil central furnaces with single phase electrical supply	< 225,000	78	—
Non-weatherized oil central furnaces with single phase electrical supply	< 225,000	83	—
Gas central furnaces	$\geq 225,000$	—	80
Oil central furnaces	$\geq 225,000$	—	81

Table 4-2: Minimum Heating Efficiency for Nonducted, Noncentral, Gas-Fired Heating Equipment

Type	Capacity	AFUE
Wall Furnace (fan type)	≤ 42,000 Btu/h	75%
	> 42,000 Btu/h	76%
Wall Furnace (gravity type)	≤ 27,000 Btu/h	65%
	> 27,000 Btu/h and ≤ 46,000 Btu/h	66%
	> 46,000 Btu/h	67%
Floor Furnace	≤ 37,000 Btu/h	57%
	> 37,000 Btu/h	58%
Room Heater	≤ 20,000 Btu/h	61%
	> 20,000 Btu/h and ≤ 27,000 Btu/h	66%
	> 27,000 Btu/h and ≤ 46,000 Btu/h	67%
	> 46,000 Btu/h	68%

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Table 4-3: Minimum Heating Efficiency for Heat Pumps

Equipment Type	Reference	Configuration/Size	Minimum Heating Efficiency
Packaged terminal heat pumps (heating mode)	Table 110.2 E	Newly constructed or newly conditioned buildings or additions	$3.7 - (0.052 \times \text{Cap}^1/1000) = \text{COP}$
Packaged terminal heat pumps (heating mode)	Table 110.2 E	Replacements	$2.9 - (0.026 \times \text{Cap}^1/1000) = \text{COP}$
Single-phase air source heat pumps (NAECA)	Table C-2	< 65,000 Btu/h cooling	Packaged 8.0 HSPF Split 8.2 HSPF
		Space constrained < 65,000 Btu/h cooling capacity	Packaged 7.4 HSPF Split 7.4 HSPF
		Small-duct, high-velocity < 65,000 Btu/h cooling capacity	7.7 HSPF
Three-phase air source heat pumps	Table C-3	< 65,000 Btu/h	Packaged 7.7 HSPF Split 7.7 HSPF
		≥ 65,000 and < 135,000	3.3 COP
		≥ 135,000 and < 240,000	3.2 COP
		≥ 240,000 and < 760,000	3.2 COP
Water-source heat pumps	Table C-4	≥ 65,000 and < 135,000 Btu/h	4.2 COP
		≥ 135,000 Btu/h, < 240,000 Btu/h	2.9 COP
Single package vertical heat pumps	Table C-5	< 65,000 single-phase	3.0 COP
		< 65,000 3-Phase	3.0 COP
		≥ 65,000 and < 135,000	3.0 COP
		≥ 135,000 and < 240,000	2.9 COP

1. Cap = Cooling Capacity

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Table 4-6: Minimum Cooling Efficiencies for Central Air Conditioners and Heat Pumps With Cooling Capacity Less Than 65,000 Btu per Hour (NR = No Requirement)

Appliance	Type	SEER Eff 1/1/2015	EER Eff 1/1/2015
Central Air Conditioners ¹	Split System <45,000 Btuh	14	12.2
	Split System ≥45,000 Btuh	14	11.7
	Single Package	14	11.0
Central Air Source Heat Pumps	Split System	14	NR
	Single Package	14	NR
Space Constrained Air Conditioner	Split System	12	NR
	Single Package	12	NR
Space-Constrained Heat Pump	Split System	12	NR
	Single Package	12	NR
Small-Duct, High-Velocity Air Conditioner	All	12	NR
Small-Duct, High-Velocity Heat Pump	All	12	NR

1. Central split system air conditioners and central single package air conditioners *installed* on or after January 1st, 2015 must comply with the minimum SEER and EER requirements of this table regardless of date of manufacturer.

Table 4-7: Minimum Cooling Efficiency for Three-Phase Models and Larger Capacity Central Air Conditioners and Heat Pumps

Equipment Type	Size Category	SEER or EER
Central Air Conditioners	< 65,000 Split System ¹	13.0 SEER
	< 65,000 Single Packaged ²	13.0 SEER
	≥65,000 Btu/h but <135,000 Btu/h	11.2 ³ EER 11.0 ² EER
	≥135,000 Btu/h but <240,000 Btu/h	11.0 ³ EER 10.8 ² EER
	≥240,000 Btu/h but <760,000 Btu/h	10.0 ³ EER 9.8 ² EER
Central Air Source Heat Pumps	< 65,000 Split System ¹	13.0 SEER
	< 65,000 Single Packaged ²	13.0 SEER
	≥ 65,000 Btu/h but <135,000 Btu/h	11.0 ³ EER 10.8 ² EER
	≥135,000 Btu/h but <240,000 Btu/h	10.6 ³ EER 10.4 ² EER
	≥240,000 Btu/h but <760,000 Btu/h	9.5 ³ EER 9.3 ² EER
Central Water Source Heat Pumps	< 17,000 Btu/h	11.2 EER
	≥ 17,000 Btu/h and < 65,000 Btu/h	12.0 EER
	≥ 65,000 Btu/h and < 135,000 Btu/h	11.9 EER
	≥ 135,000 Btu/h and < 240,000 Btu/h	12.3 EER
	≥ 240,000 Btu/h and < 760,000 Btu/h	12.2 EER
Water-Cooled Air Conditioners	< 17,000 Btu/h	12.1 EER
	< 17,000 < 65,000 Btu/h	12.1 EER
	≥ 65,000 Btu/h and < 135,000 Btu/h	12.1 ³ EER
	≥ 135,000 Btu/h and < 240,000 Btu/h	12.5 ³ EER
	≥ 240,000 Btu/h and < 760,000 Btu/h	12.4 ³ EER

¹ Three-phase models only
² Applies to equipment that has electric resistance heat or no heating.
³ Applies to equipment with all other heating-system types that are integrated into the unitary equipment.
 Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.

RES MANDATORY

- 150.0(k) Lighting:
 - All installed luminaires to be high efficacy, some that would require certification by the Commission, and others that do not: (Table 150.0-A)
 - No certification: No controls (switch only)
 - Other than recessed luminaires
 - Pin Based linear or compact using electronic ballasts
 - Pulse start Halide
 - High pressure sodium
 - GU-24 containing other than LED
 - Does not have to comply with Apx. JA8
 - Certification required: Require dimmers or vacancy sensors
 - Recessed light luminaires (must be pin-no screw)
 - GU-24 sockets containing LED (could be screw based)
 - All others not listed
 - Must comply with Apx. JA8



TABLE 150.0-A CLASSIFICATION OF HIGH EFFICACY LIGHT SOURCES

High Efficacy Light Sources	
Luminaires installed with only the lighting technologies in this table shall be classified as high efficacy	
Light sources in this column other than those installed in ceiling recessed downlight luminaires are classified as high efficacy and are not required to comply with Reference Joint Appendix JA8	Light sources in this column shall be certified to the Commission as High Efficacy Light Sources in accordance with Reference Joint Appendix JA8 and be marked as meeting JA8.
1. Pin-based linear or compact fluorescent light sources using electronic ballasts. 2. Pulse-start metal halide. 3. High pressure sodium. 4. GU-24 sockets containing light sources other than LEDs. ^{a,b} 5. Luminaires with hardwired high frequency generator and induction lamp. 6. Inseparable SSL luminaires that are installed outdoors. 7. Inseparable SSL luminaires containing colored light sources that are installed to provide decorative lighting.	8. All light sources in ceiling recessed downlight luminaires. Note that ceiling recessed downlight luminaires shall not have screw bases regardless of lamp type as described in Section 150.0(k)1C. 9. GU-24 sockets containing LED light sources. 10. Any light source not otherwise listed in this table and certified to the Commission as complying with Joint Appendix 8.
Notes:	

a. GU-24 sockets containing light sources such as compact fluorescent lamps and induction lamps.
 b. California Title 20 Section 1605(k)3 does not allow incandescent sources to have a GU-24 base.

RES MANDATORY

- 150.0(k)1B Blank Electrical Boxes:
 - Number of electrical boxes > 5' above floor that do not contain luminaires shall not be greater than the number of bedrooms.
 - Boxes to be served by either vacancy sensor, dimmer control or fan speed control
- 150.0(k)1C Recessed Luminaires in Ceilings:
 - Listed, labeled, sealed, ballasts readily accessible, not screw based, light source to comply with Apx. JA8
- 150.0(k)2J Bathrooms, garages, Laundry Rooms & Utility Rooms to have at least one luminaire in each space controlled by a vacancy sensor
- Dimmers or vacancy sensors to control all luminaires required to comply with Apx. JA8 (but not others), Except:
 - Closets < 70 sq ft
 - Hallways
- 150.0(k)2L Under cabinet lights to be switched separately

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RES MANDATORY

- 150.0(k)3 Outdoor Lighting for SFD-attached to the building
 - In addition to being high efficacy:
 - Manual on-off switch; AND
 - Photocell AND motion sensor; OR
 - Photocell AND time switch; OR
 - Astronomical time clock, programmed to turn off during daylight; OR
 - Energy Management System
 - (note that controls that would override to ON shall reset after 6 hours)
- 150.0(m)1 Minimum duct insulation R-4.2 even in conditioned spaces
- 150.0(m)11A Allowable duct leakage is now 5% instead of 6% for SFD & townhomes (not for multi-dwellings)
- 150.0(n)4 Instantaneous water heaters with input > 6,800 Btu/h (2kW) shall comply with Section 110.3(c)7 (Isolation valves on cold & hot & HB on each valve for flushing)

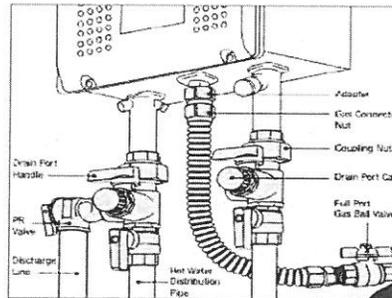
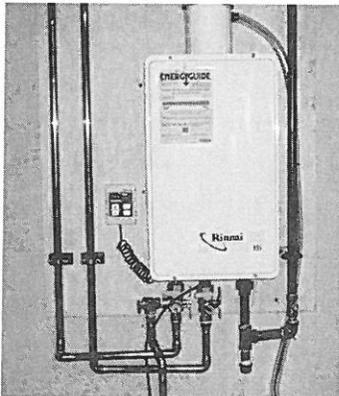
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RES MANDATORY

- 150.0(k)3 Outdoor Lighting for SFD-attached to the building
 - In addition to being high efficacy:
 - Manual on-off switch; AND
 - Photocell AND motion sensor; OR
 - Photocell AND time switch; OR
 - Astronomical time clock, programmed to turn off during daylight; OR
 - Energy Management System
 - (note that controls that would override to ON shall reset after 6 hours)
- 150.0(m)1 Minimum duct insulation R-4.2 even in conditioned spaces
- 150.0(m)11A Allowable duct leakage is now 5% instead of 6% for SFD & townhomes (not for multi-dwellings)

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- 150.0(n)4 Instantaneous water heaters with input > 6,800 Btu/h (2kW) shall comply with Section 110.3(c)7 (Isolation valves on cold & hot & HB on each valve for flushing)



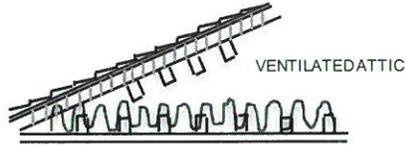
Mandatory

- ✦ Isolation valves on both the cold water supply and the hot water pipe leaving the water heater, and hose bibbs on each valve for flushing the water heater.

RES PRESCRIPTIVE

- 150.1(c)1A Options in meeting ceiling insulation:
 - **Option A:** Continuous insulation installed above roof rafters in contact with roof deck with additional layer of insulation between attic & conditioned space (*air handler & ducts could then be installed in attic as per 150.1(c)9A*); OR

Radiant Barrier
(in most CZs)
R-38 @ Clg
+R-8 @ roof
for most CZ

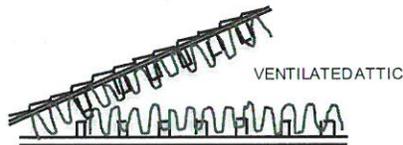


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RES PRESCRIPTIVE

- 150.1(c)1A Options in meeting ceiling insulation:
 - **Option B:** Insulation installed inside roof rafters in contact with roof deck with additional layer of insulation between attic & conditioned space (*air handler & ducts could then be installed in attic as per 150.1(c)9A*); OR

Radiant Barrier
(in some CZs)
R-38 @ Clg
+R-18 @ roof
for most CZ



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Figure 3-18 - Option A (left) and Option B (right)

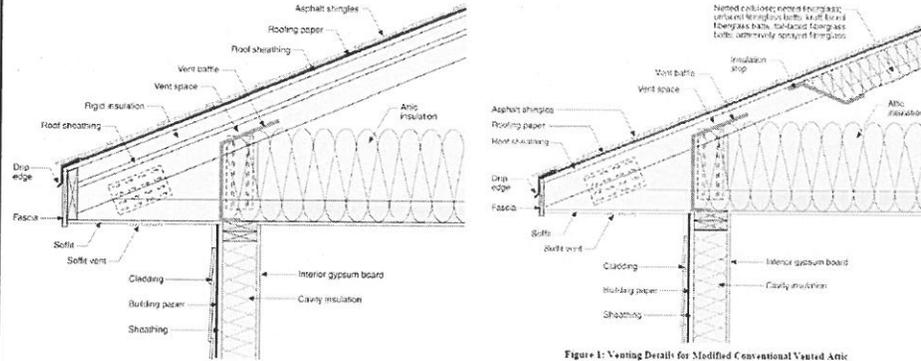


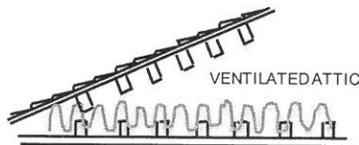
Figure 1: Venting Details for Modified Conventional Vaulted Attic

Source: Building Science Corporation

RES PRESCRIPTIVE

- 150.1(c)1A Options in meeting ceiling insulation:
 - **Option C:** Insulation installed between attic & conditioned space as per 150.1(c)9B: Ducts and air handlers to be in **conditioned space** furnaces shall be the direct-vent type with combustion air from outdoors. Field verified. *Except ductless systems, including ductless mini split systems, hydronic heating & cooling, terminal heat pumps, terminal A/C with hydronic heating or sealed gas heating or sealed combustion wall furnaces.*

Radiant Barrier
R-38 @ Cg
for most CZ



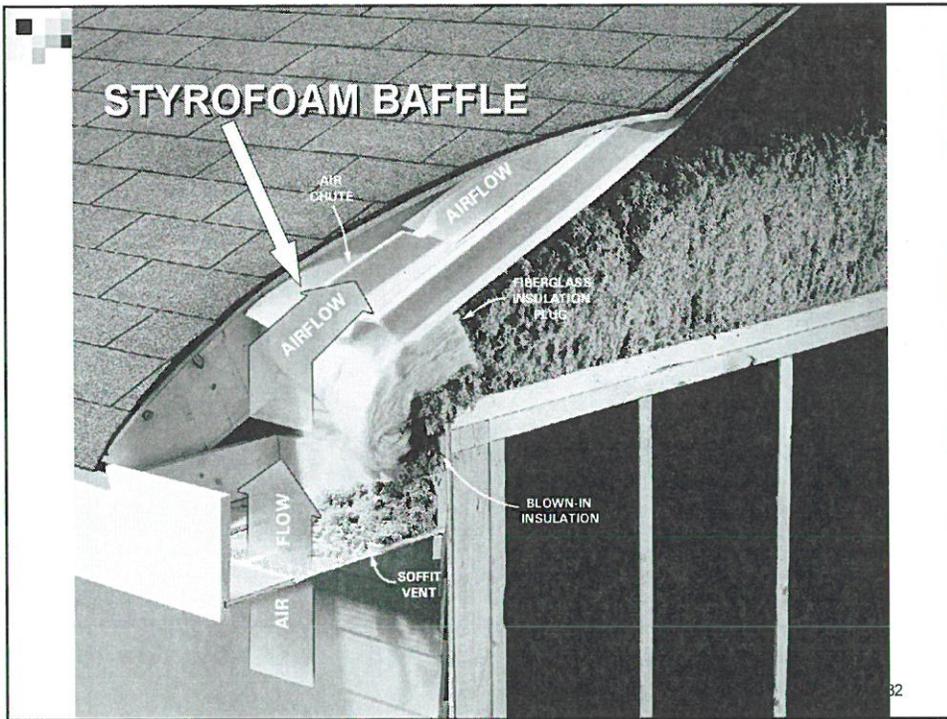
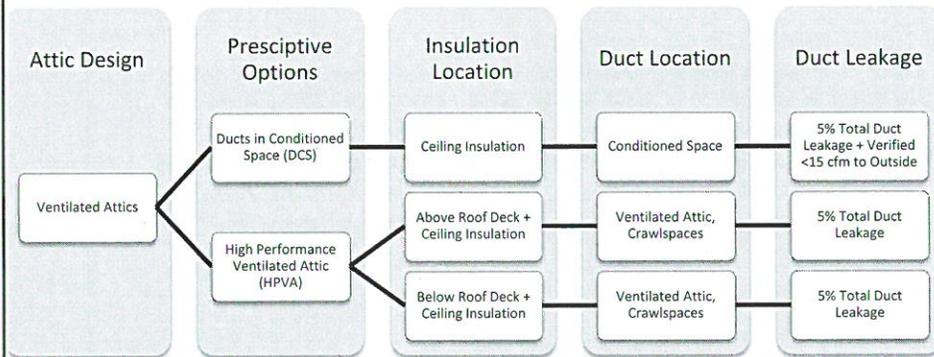


Figure 3-15: – Ventilated Attic Prescriptive Compliance Choices



RES PRESCRIPTIVE

- Only ventilated attic-type buildings are allowed to use the prescriptive method. If vaulted/cathedral ceilings anywhere in the building, must use the performance method for the entire building.
- Provide maximum U-value for the framed wall assemblies and R-value of insulation for mass walls in Table 150.1-A

Required: $U=0.051$ for CZ 1-5 & 8-16 & $U=0.065$ for CZ 6 & 7

Figure 3-30: Examples of Wood-Framed Wall Assemblies and U-Factors, Assuming Gypsum Board Interior

Stud	Cavity Insulation	Cavity Insulation Type	Exterior Insulation	U-Factor
2x4	R15	High density batt	R4	0.065
2x6	R21	Loose-fill cellulose or high density batt	R4	0.051
2x6	R19	Low density batt	R5	0.051
2x4	R15	High density batt	R8	0.050
2x6	R31	Closed-cell spray foam (ccSPF)	R2	0.050
2x6	R23	High density batt or mineral wool	R4	0.049

RES PRESCRIPTIVE

- 150.1(c)7A Instead of CID (Charge Indicator Display) it is now called FID (Fault Indicator Display)
- 150.1(c)8A Domestic water heating systems serving individual dwelling units, either:
 - A single gas or propane instantaneous 200,000 Btu/h heater (0.83 EF) & if circulation, on-demand type; or
 - A single gas or propane storage 105,000 Btu/h, >55 gal heater & if circulation, on-demand type, with either a compact distribution system (max length of pipe to fixture-Table 5-10 next) or all piping to be insulated. Both to be field verified. (Note that efficiency of WH is required to be 0.76)
 - Same as second option if WH ≤55 gal but with "*the dwelling unit shall meet all the requirements of Q11*" (Note that efficiency is required to be only 0.60)

COMPACT DISTRIBUTION SYSTEM

Table 5-10 – Compact Distribution System

<i>Floor Area Served (ft²)</i>	<i>Maximum Water Heater To Use Point Distance (ft)</i>
< 1000	28'
1001 – 1600	43'
1601 – 2200	53'
2201 – 2800	62'
>2800	68'

RES PRESCRIPTIVE

- 150.1(c)8D Section that allowed electric water heater coupled with 50% solar if natural gas is not available has been deleted. Must use performance
- 150.1(c)9 Ducts & air handlers have to either be in "high performance attic" (insulation at ceiling and roof) or be in conditioned space (& field verified). Ducts to be insulated as per Table 150.1-A with a minimum R-4.2 even if in conditioned space.
- Furnaces in conditioned space to meet combustion air requirements of CMC.
- 150.1(c)12 Changes in whole house fan (cooling) as follows:
 - Capacity 1.5 cfm/sq ft (instead of 2 cfm/sq ft)
 - Attic ventilation area 1 sq ft/750 cfm (instead of 375 cfm); or the mfg requirements, if greater
- Table 150.1-A changed with three types of ceiling/roof (Options A, B & C), in addition to changes in walls & floor insulation. Also, changes in the duct insulation requirements

Air space = Tile
No air space = Shingles

TABLE 150.1-A COMPONENT PACKAGE-A STANDARD BUILDING DESIGN

				Climate Zone																						
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
Building Envelope Insulation	Roofs/Ceilings	Option A (meets §150.1(c)9A)	Continuous Insulation Above Roof Filter	Roofing Type	NR	NR	NR	R 8	NR	NR	NR	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	
			With Air Space ¹	NR	NR	NR	R 6	NR	NR	NR	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6	R 6
			Ceiling Insulation	R 38	R 38	R 30	R 38	R 30	R 30	R 30	R 38															
		Option B (meets §150.1(c)9A)	Radiant Barrier	NR	REQ	NR																				
			Below-Roof Deck Insulation	Roofing Type	NR	NR	NR	R 18	NR	NR	NR	R 18														
			With Air Space	NR	NR	NR	R 13	NR	NR	NR	R 13															
	Option C (meets §150.1(c)9B)	Ceiling Insulation	R 38	R 38	R 30	R 38	R 30	R 30	R 30	R 38																
		Radiant Barrier	NR	REQ	REQ	NR	REQ	REQ	REQ	NR																
		Ceiling Insulation	R 38	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 38													
		Radiant Barrier		NR	REQ	NR																				
				R 38	R 30	R 38																				
				NR	REQ	NR																				

TABLE 150.1-A COMPONENT PACKAGE-A STANDARD BUILDING DESIGN (CONTINUED)

		Climate Zone																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
Building Envelope	Walls	Above Grade	Mass Wall Intertec ^d	U 0.070 R 13	U 0.070 R 13															
			Mass Wall Intertec ^e	U 0.125 R 8.0	U 0.135 R 8.0	U 0.1025 R 8.0	U 0.125 R 8.0	U 0.070 R 13												
		Below Grade	Below Grade Intertec ^d	U 0.070 R 13	U 0.100 R 10	U 0.100 R 10	U 0.066 R 15													
			Below Grade Intertec ^e	U 0.200 R 5.0	U 0.100 R 10	U 0.100 R 10	U 0.053 R 19													
		Floors	Slab Perimeter	NR	NR	NR	U 0.58 R 7.0													
			Raised	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19													
	Building Envelope Penetration	Roof Products	Low-sloped	NR	NR	NR	NR													
			Steep Sloped	NR	NR	NR	NR													
		Maximum U-factor	Maximum SHGC	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
			Maximum Total Area	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Maximum West Facing Area	NR	5%	NR	5%	NR	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%		

CONTINUED: TABLE 150.1-A COMPONENT PACKAGE-A STANDARD BUILDING DESIGN (CONTINUED)

		Climate Zone																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
HVAC SYSTEM	Space Heating	Electric-Resistance Allowed	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
		If gas, AFUE	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		If Heat Pump, HSPF ⁹	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
	Space cooling	SEER	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		Refrigerant Charge Verification or Fault Indicator Display	NR	REQ	NR	NR	NR	NR	NR	REQ	NR							
	Central System Handlers	Whole House Fan ¹⁰	NR	NR	NR	NR	NR	NR	NR	REQ	NR	NR						
		Central Fan Integrated Ventilation System Fan Efficacy	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
	Duct ¹²	Roof/Ceiling Option A & B	Duct Insulation	R-8	R-8	R-6	R-8	R-6	R-6	R-6	R-8							
			§150.1(c)(9A)	NA														
	Duct ¹²	Roof/Ceiling Option C	Duct Insulation	R-6														
§150.1(c)(9B)			REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
Water Heating	All Buildings	System Shall meet Section 150.1(c)(8)																

RES ADDITIONS & ALTERATIONS

- 150.2(a)1A&B Can keep dimension of exist wall: require 2 x 4 walls of the addition to have R-15 & 2 x 6 walls to have R-19
- 150.2(a)B Roof & ceiling insulation to meet prescriptive requirements. Additions < 700 sq ft to meet mandatory levels
- 150.2(a)1D Electric water heater, if allowed, can have on-demand recirculation (re-circulations was not allowed)
- 150.2(b)1 Exempt alteration from 150.0(n) (water heater electric plug, condensate drain, etc.)
- 150.2(b)1D & Table 150.2-A Altered duct: new or replacement duct > 40': insulation: R-8 in CZ11, 14 thru 16 & R-6 for rest; and field verified for leakage (5% if > 75%; 15%, 10%, smoke if less)

TABLE 150.2-A DUCT INSULATION R-VALUE

Climate Zone	1 through 10, 12&13	11, 14 through 16
Duct R-Value	R-6	R-8
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RES ADDITIONS & ALTERATIONS

- 150.2(b)1E Alterations—altered or replaced heating/cooling equipment requires:
 - Duct testing (reduced: 15%, 10%, smoke), unless asbestos or < 40' (*verified*)
 - Setback thermostat
 - 300 min. cfm/ton (or return ducts sizing) (*verified*)
 - Refrigerant charge (*verified*) (unless factory tested & certified)
- 150.2(b)1G(i) New hot water piping to comply with all insulation requirements of 150.0(j)2 (5', 3/4", recirculating, kitchen,...)-(note CPC)
- Existing accessible to only comply with 5', recirc.
- 150.2(b)1G(ii) Replacement water heater can either be gas & if recirculation, on-demand; or
- If no natural gas available, can be electric with max 60 gallons & if recirculation, on-demand (instead of no recirc.)
- 150.2(b)1I Altered lighting to comply with 150.0(k) & Table 150.0-A (mandatory requirements, all high efficacy with controls)

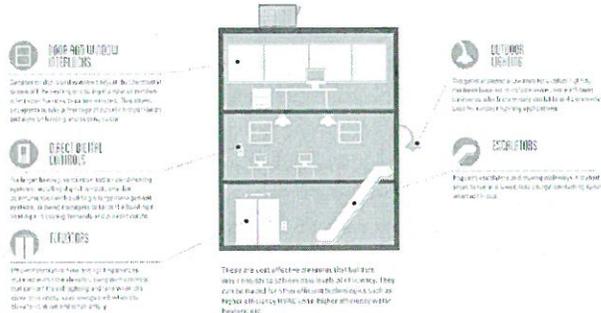
NON-RESIDENTIAL & HI-RISE RESIDENTIAL HOTELS & MOTELS

NON-RESIDENTIAL HI-RISE RESIDENTIAL HOTELS & MOTELS

CALIFORNIA'S 2016 - NONRESIDENTIAL BUILDING ENERGY EFFICIENCY STANDARDS

The state's new energy standards for non-residential buildings have been updated to reflect the most current energy codes. The standards are more stringent and better address the challenges of high-rise buildings and other non-residential buildings. The standards are more stringent than the 2013 standards and are more in line with the 2015 International Energy Conservation Code (IECC).

5% Increased Stringency



NON-RES MANDATORY

- 120.2(j) Require Direct Digital Controls (DDC) with certain capabilities, as per Table 120.2-A
 - New:
 - Air systems ≥ 300 kBtu/h fans w/>3 zones (htg or 25 tons clg)
 - Chilled water plants ≥ 300 kBtu/h w/>3 zones
 - Hot water plants ≥ 300 kBtu/h w/>3 zones
 - Additions or alterations
 - VAV systems with existing DDC
 - Air handling systems or fan coils with existing DDC
 - New air handling systems & new zones, ≥ 300 kBtu/h w/>3 zones & more than 75% of zones are new
 - New chillers or boilers in new or upgraded ≥ 300 kBtu/h plants

TABLE 120.2-A DDC APPLICATIONS AND QUALIFICATIONS

BUILDING STATUS	APPLICATIONS	QUALIFICATIONS
Newly Constructed Buildings	Air handling system and all zones served by the system	Individual systems supplying more than three zones and with design heating or cooling capacity of 300 kBtu/h and larger
Newly Constructed Buildings	Chilled water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design cooling capacity of 300 kBtu/h (87.9 kW) and larger
Newly Constructed Buildings	Hot water plant and all coils and terminal units served by the system	Individual plants supplying more than three zones and with design heating capacity of 300 kBtu/h (87.9 kW) and larger
Additions or Alterations	Zone terminal unit such as VAV box	Where existing zones served by the same air handling, chilled water, or hot water systems that have DDC
Additions or Alterations	Air handling system or fan coil	Where existing air handling system(s) and fan coil(s) served by the same chilled or hot water plant have DDC
Additions or Alterations	New air handling system and all new zones served by the system	Individual systems with design heating or cooling capacity of 300 kBtu/h and larger and supplying more than three zones and more than 75 percent of zones are new
Additions or Alterations	New or upgraded chilled water plant	Where all chillers are new and plant design cooling capacity is 300 kBtu/h (87.9 kW) and larger
Additions or Alterations	New or upgraded hot water plant	Where all boilers are new and plant design heating capacity is 300 kBtu/h (87.9 kW) and larger

NON-RES MANDATORY

- 120.2(k) DDC to zone level to have "Optimum Start-up & Stop Control"
- 120.3 Minor changes to piping insulation requirements: (also note CPC ins. req.)

Table 4-15 –Pipe Insulation Thickness

FLUID TEMPERATURE RANGE (°F)	CONDUCTIVITY RANGE (in Btu-inch per hour per square foot per °F)	INSULATION MEAN RATING TEMPERATURE (°F)	NOMINAL PIPE DIAMETER (in inches)				
			<1	1 to <1.5	1.5 to <4	4 to <8	≥8
			INSULATION THICKNESS REQUIRED (in inches)				
Space heating and service water heating systems (steam, steam condensate and hot water);							
Above 350	0.32-0.34	250	4.5	5.0	5.0	5.0	5.0
251-350	0.29-0.32	200	3.0	4.0	4.5	4.5	4.5
201-250	0.27-0.30	150	2.5	2.5	2.5	3.0	3.0
141-200	0.25-0.29	125	1.5	1.5	2.0	2.0	2.0
105-140	0.22-0.28	100	1.0	1.5	1.5	1.5	1.5
Space cooling systems (chilled water, refrigerant and brine)							
			Nonres	Res	Nonres	Res	
40-60	0.21-0.27	75	0.5	0.75	0.5	0.75	1.0 1.0 1.0
Below 40	0.20-0.26	50	1.0	1.5	1.5	1.5	1.5

NON-RES MANDATORY

- 120.6(f) New requirements for elevators:
 - Light density to not exceed 0.6 w/sq ft
 - Ventilation fans not to exceed 0.33 w/CFM
 - Auto shutoff light & ventilation when doors closed & unoccupied > 15 minutes
 - Light & ventilation to continue if elevator stuck between floors w/occupants
 - Acceptance testing for light & ventilation
 - NRCC-PRC-01 & 12
- 120.6(g) New requirements for escalators & moving walkways in airports, hotels & transportation (not malls):
 - Slow to minimum speeds when not conveying passengers (variable speed motors; sensors)
 - Acceptance testing
 - NRCC-PRC-1 & 13

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NON-RES MANDATORY

- 120.7(a)3 Insulation placement:
 - Insulation not to be installed on suspended ceiling with removable ceiling tiles unless area < 2,000 sq ft & height between insulated ceiling & roof > 12'
- 120.7(b)7 Demising walls insulation-U=0.099 (R-13) for wood walls & U 0.151 for metal walls (R-13+R-2), masonry/tilt-up, no insulation (moved from 110.8(f))
- 120.8 Commissioning reports required for the non-res areas of hotel or high rise building
- 120.8 Area of the non-res part is the criteria rather than entire area of building (10,000; 50,000)

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NON-RES PRESCRIPTIVE

- 140.3(a)1Aia. Change exception to require $U=0.034$ (instead of 0.039) for wood roofs not complying with cool roof in CZ 3 & 5
- Table 140.3 Changes to reflect the above changes, in addition to other changes
- Tables 140.3-B & 140.3-C Changes (for non-res & high rise res)

TABLE 140.3 ROOF/CEILING INSULATION TRADEOFF FOR AGED SOLAR REFLECTANCE

Aged Solar Reflectance	Nonresidential		
	Metal Building	Wood framed and Other	Wood Framed and Other
	Climate Zone 1-16 U-factor	Climate Zone 6 & 7 U-factor	All Other Climate Zones U-factor
0.62-0.56	0.038	0.045	0.032
0.55-0.46	0.035	0.042	0.030
0.45-0.36	0.033	0.039	0.029
0.35-0.25	0.031	0.037	0.028

TABLE 140.3-B – PRESCRIPTIVE ENVELOPE CRITERIA FOR NONRESIDENTIAL BUILDINGS (INCLUDING RELOCATABLE PUBLIC SCHOOL BUILDINGS WHERE MANUFACTURER CERTIFIES USE ONLY IN SPECIFIC CLIMATE ZONE; NOT INCLUDING HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS)

		Climate Zone																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Envelope	Maximum U-factor	Roofs/Ceilings																
		Metal Building	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
		Wood Framed and Other	0.034	0.034	0.034	0.034	0.034	0.049	0.049	0.049	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
		Metal Building	0.113	0.061	0.113	0.061	0.061	0.113	0.113	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.061
		Metal-framed	0.069	0.062	0.082	0.062	0.062	0.069	0.069	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
		Mass Light ¹	0.196	0.170	0.278	0.227	0.440	0.440	0.440	0.440	0.440	0.170	0.170	0.170	0.170	0.170	0.170	0.170
	Mass Heavy ¹	0.253	0.650	0.650	0.650	0.650	0.690	0.690	0.690	0.690	0.650	0.184	0.253	0.211	0.184	0.184	0.160	
	Wood-framed and Other	0.095	0.059	0.110	0.059	0.102	0.110	0.110	0.102	0.059	0.059	0.045	0.059	0.059	0.059	0.042	0.059	
	Flashes/Soffits																	
	Raised Mass	0.092	0.092	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.092	0.092	0.092	0.092	0.092	0.058	
	Other	0.048	0.039	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.039	0.071	0.071	0.039	0.039	0.039	
	Aged Solar Reflectance	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	
	Thermal Emittance	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
	Roofing Products																	
Low-Sloped																		
Aged Solar Reflectance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20		
Thermal Emittance	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		
Stops																		
Shaped																		
Thermal Emittance	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		
Air Barrier	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ		
Exterior Doors, Maximum U-factor																		
Non-Swinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50		
Swinging	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70		

CONTINUED: TABLE 140.3-B – PRESCRIPTIVE ENVELOPE CRITERIA FOR NONRESIDENTIAL BUILDINGS (INCLUDING RELOCATABLE PUBLIC SCHOOL BUILDINGS WHERE MANUFACTURER CERTIFIES USE ONLY IN SPECIFIC CLIMATE ZONE; NOT INCLUDING HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS)

		All Climate Zones					
		Fixed Window	Operable Window	Curtainwall or Storefront	Glazed Doors ²		
Envelope	Vertical	Area-Weighted Performance Rating	Max U-factor	0.36	0.46	0.41	0.45
			Max RSHGC	0.25	0.22	0.26	0.23
		Area-Weighted Performance Rating	Min VT	0.42	0.32	0.46	0.17
			Maximum WWR%	40%			
Skylights	Area-Weighted Performance Rating	Max U-factor	Glass, Curb Mounted	0.58	0.46	Plastic, Curb Mounted	
			Max SHGC	0.25	0.25	NR	
		Min VT	0.49	0.49	0.64		
			Maximum SRR%	5%			

TABLE 140.3-C – PRESCRIPTIVE ENVELOPE CRITERIA FOR HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS

			Climate Zone																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Envelope	Maximum U-factor	Roofs/ Ceilings	Metal Building	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	
			Wood Framed and Other	0.028	0.028	0.034	0.028	0.034	0.034	0.039	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	
		Walls	Metal Building	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.057	0.057	0.057	0.057	0.057	0.057
			Metal-framed	0.069	0.069	0.069	0.069	0.069	0.069	0.105	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.048	0.069
			Mass Light ¹	0.170	0.170	0.170	0.170	0.170	0.227	0.227	0.227	0.196	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
	Mass Heavy ¹		0.160	0.160	0.160	0.184	0.211	0.690	0.690	0.690	0.690	0.690	0.184	0.253	0.211	0.184	0.184	0.184	0.160	
		Wood-framed and Other	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.042	0.059	0.059	0.059	0.042	0.042	0.042	
	Roofing Products	Flats/ Sloffits	Raised Mass	0.045	0.045	0.058	0.058	0.058	0.069	0.092	0.092	0.092	0.069	0.058	0.058	0.058	0.045	0.058	0.037	
			Other	0.034	0.034	0.039	0.039	0.039	0.039	0.071	0.039	0.039	0.039	0.039	0.039	0.039	0.034	0.039	0.034	
		Steps/ Sloped	Aged Solar Reflectance	NR	0.55	0.55	0.55	NR	0.55	0.55	NR									
	Thermal Emittance		NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	0.75	0.75	NR	0.75	0.75	NR		
	Aged Solar Reflectance		NR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NR	
	Thermal Emittance		NR	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	NR	
	Exterior Doors, Maximum U-factor	Non-Swinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50		
		Swinging	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70		

CONTINUED: TABLE 140.3-C – PRESCRIPTIVE ENVELOPE CRITERIA FOR HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS

			All Climate Zones					
			Fixed Window	Operable Window	Curtainwall/ Storefront	Glazed Doors ²		
Envelope	Fenestration	Vertical	Area-Weighted Performance Rating	Max U-factor	0.36	0.46	0.41	0.45
				Max RSHGC	0.25	0.22	0.26	0.23
			Area-Weighted Performance Rating	Min VT	0.42	0.32	0.46	0.17
			Maximum WWR%		40%			
		Skylights			Glass, Curb Mounted	Glass, Deck Mounted	Plastic, Curb Mounted	
	Area-Weighted Performance Rating		Max U-factor	0.58	0.46	0.88		
			Max SHGC	0.25	0.25	NR		
	Area-Weighted Performance Rating		Min VT	0.49	0.49	0.64		
			Maximum SRR%		5%			

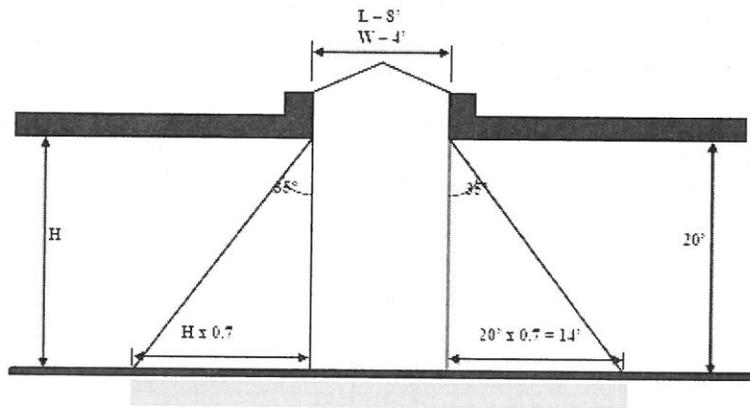
Notes:

1. Light mass walls are walls with a heat capacity of at least 7.0 Btu/ft²-°F and less than 15.0 Btu/ft²-°F. Heavy mass walls are walls with a heat capacity of at least 15.0 Btu/ft²-°F.
2. Glazed Doors applies to both site-built and to factory-assembled glazed doors.

NON-RES PRESCRIPTIVE

- 140.3(c)4 Minimum skylight area cannot be less than 3% of its daylit area ($0.7 \times H$)
- (In CZ 2-15 spaces > 5,000 sq ft and 15' to roof: must have glazing (skylights) to daylight 75% of floor area)

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$$14' + 14' = 28'$$

$$L = 28' + 8' = 36'$$

$$W = 28' + 4' = 32'$$

DAYLIT AREA

36' long, 32' wide, area = 1,152 ft²

Skylight area as percentage of daylit floor area $\leq 3\%$
 As shown: skylight area must be increased as it is only
 2.8%

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Therefore, increase to 9 x 4 (or equivalent)

NON-RES PRESCRIPTIVE

- 140.4(e)5 Economizers > 65,000 Btu/h DX *that control capacity of mechanical equipment based on occupied space temperature* to have 2 stages;
- Others (large VAV w/ multiple compressors) to comply with the following table

TABLE 140.4-C DIRECT EXPANSION (DX) UNIT REQUIREMENTS FOR COOLING STAGES AND COMPRESSOR DISPLACEMENT

Cooling Capacity	Minimum Number of Mechanical Cooling Stages	Minimum Compressor Displacement
≥ 65,000 Btu/h and < 240,000 Btu/h	3 stages	≤ 35% full load
≥ 240,000 Btu/h	4 stages	≤ 25% full load

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NON-RES PRESCRIPTIVE

- Fan system listed in Table 140.4-D shall be designed to vary the indoor fan flow as a function of the load.

TABLE 140.4-D FAN CONTROL SYSTEMS

Cooling System Type	Fan Motor Size	Cooling Capacity
DX Cooling	any	≥ 65,000 Btu/hr
Chilled Water and Evaporative	≥ 1/4 HP	any

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NON-RES PRESCRIPTIVE

- 140.4(n) Mechanical System Shut-off
 - Spaces with operable openings to outdoor to have interlock control to reset temperature to set back (55 heating, 90 cooling) when open for > 5 minutes; Except:
 - Door with closing devices
 - Spaces without T-stat
 - (Note, ventilation should stay on)
- (Note this would also affect high rise residential using prescriptive method)

NON-RES ADD & ALT

- 141.0(b)2 Altered skylights to meet Table 140.3-B or C [package] (instead of Table 141.0-A)
- 141.0(b)2(c) Exempt new or replaced A/C units from new Section 140.4(n) "Interlock with operable openings"
- 141.1 Remove reduced requirements for covered processes in additions or alterations & reference the mandatory requirements of 120.6 & the prescriptive requirements of 140.9
- 141.0(a) Additions: Includes Solar-ready requirements, Process and Commissioning requirements (forms)
- 141.0(b)2&3 Alterations: Includes Process but does not include Solar Ready or Commissioning requirements
- 141.0(b)2 Alterations to existing space conditioning would not require Fault Detection on economizers